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New Maine Collembola.

By the late F. L. HARVEY, Orono, Me.

Plate XV.

Entomobrya (Sinella) aglis. n. sp. (Pl. xv, figs. 2–4).

White, excepting the eye patches which are brown; clothed with plumose hairs, those about the head and neck, and scattered ones on the body, bowed and clubbed. Antennæ about as long as the head, thick set, joints in one specimen in the ratio 4 : 6 : 5 : 13, in another 8 : 15 : 12 : 27; the terminal joint nearly as long as the other three joints together, two and three broad at the distal and narrow at the proximal end, clothed with hairs, those on the terminal joint verticillate. Eye patches two on each side of the head, small; the anterior larger and bearing two ocelli close together and transversely arranged; the posterior elongated, with a single ocellus, at the anterior end. Legs rather stout and hairy; superior claw with two teeth on the inner edge, one tooth near the middle and the other half way between it and the distal end, sides of the claw depressed; inferior claw plain, half as long as the superior, apparently round and gradually sloping to the apex; a single tenent hair bulbous at the end.

Furculum more than half as long as the body and head together, manubrium and dentes nearly equal in length, dentes corrugated transversely on the under surface, two stout plumose hairs extend beyond the end of the mucrones. Mucrones with two teeth in side view, the first forming a hook at the end, the other at right angles to the mucrone.

A small, active, rather thick set species. Found in the cellar under boards and barrels at Oróno. Size about 1 mm. Four specimens examined November, 1898, and other specimens taken in April, 1899, by F. L. Harvey.

Remarks.—The eye patches are somewhat variable in outline, usually separated, but sometimes connected by pale threads of color. The bowed hairs on the body, and the stout hairs projecting beyond the dentes, are easily rubbed off and may not show in alcoholic specimens, but are easily found in fresh material.

This species in the structure of the superior claw and in the mucrones is related to *S. myrmecophila* Reut.

The eye patches are small, like those of *S. curviseta* Brook., but the ocelli are six ; the antennæ are also much shorter and the joints different The claws are very different from those of *S. Hofi* Schäffer.

It may be distinguished from the described species by the white color, small size, nature of the eye patches, the six ocelli, the stout, short, hairy antennæ. Only two American species of *Sinella* have been described ; *S. curviseta* Brook., and *S. sexoculata* Schött, from California and Mexico. The above is the first species from eastern North America. Schött, Reuter, Schäffer and Folsom think the genus *Sinella* should be merged into *Entomobrya*, an opinion also entertained by the writer.

Smyathuras brunneus n. sp. (Pl. xv, figs. 6–9).

Pale yellow with a pale brown band on the back reaching one-third down the sides and extending on to the head including the black eye patches. Starting from the penult segment and extending obliquely along the side toward the base of the legs, is a narrow extension of the brown dorsal band.

Antennæ longer than the head, pale purple, the terminal joints much darker ; the terminal joint composed of about ten sub-joints. Eye patches black, conspicuous ; ocelli eight on each side of the head.

The terminal segment armed with stout curved hairs. A few prominent hairs on the back. Legs pale, superior claw long and without teeth, inferior claw nearly as long as the superior, swollen at the base, abruptly narrowing at one-third from the base and ending in a long slender point.

The sucker prominent, when extended, reaching beyond the head, the catch conspicuous and of the form shown in fig. 6. Elater stout, when

extended reaching beyond the body, the dentes furrowed below and bearing about ten, stout, long hairs on each margin. On the under surface of the dentes, near the base of the mucrones, is a stout bristle which is swollen in the basal half and extends to about three-fourths the length of the mucrone. On the dorsal side near the base of the mucrones are a few stout curved hairs. Mucrones oblong in outline with a median and dorsal ridge, the under edge thin and without teeth.

Total length about 1 mm.

Found in May under boards where it had hibernated. Orono, May, 1898, F. L. Harvey.

Remarks.—This species is related to *S. arvalis* Fitch and *S. fitchii* Folsom, but differs in the antennal subjoints as well as in the claws. It has been called *S. brunneus* on account of the broad brown band on the back. The figures are camera lucida drawings made by the writer.

Genus? sp.? (Pl. xv, fig. 5).

Description.—White, washed with pale blue. Eye patches prominent, black, connected by a narrow band. Eight ocelli on each side of the head. Antennæ apparently four jointed, pale blue throughout, darker than the body, nearly twice as long as the head, very stout, ratio of the joints, 2 : 3 : 6 : 11. The terminal joint broad, about as long as the other three together, annulated by about twelve rings, armed with short hairs.

Claws large and stout for the size, without teeth, a single tenent hair bulbous at the end. Elater and mucrones much as in *Templetonia*. Length .6 mm.

A small, stout, active species found in celery stored in the cellar, Orono, Maine, January, 1890, F. L. Harvey.

Remarks.—We have seen only two specimens of this remarkable form. They were examined alive and finally one specimen was preserved in balsam. We had hoped to find more, but have not, and so record our notes, thinking they will be interesting, and wait for more specimens before placing the species definitely.

The ringed terminal joint of the antennæ would suggest *Templetonia*, but as species of *Templetonia* are now known without annulated antennæ, there is no reason why a species of some other genus, ordinarily with plain antennæ, may not have them ringed. The four joints to the antennæ we think would exclude this form from *Templetonia*. The prominent eye patches, eight ocelli and their arrangement, and the presence of scales would suggest *Lepidocyrtus*, but the mesonotum does not project over the head,

which would suggest *Seira*. There are scales and also long hairs covering the body; this would exclude it from *Entomobrya*.

The fourth segment of the body, however, is not much longer than the third and is more like an *Isotoma*.

We present a drawing, fig. 5, made by L. H. Homer, of the Junior Class, University of Maine, which shows the form. We will loan the slide to anyone who may care to see the specimen.

Achorutes tigrina n. sp.

The ground color straw yellow mottled with patches of deep brown; the sutures show the ground color and give a transversely banded appearance; the dark markings on the dorsum arranged in three interrupted longitudinal bands, one median and the others lateral, alternating with the ground color; these longitudinal stripes show more plainly on the middle of the body, where each segment bears about three blotches in each band. Body quite slender for the genus, covered with minute tubercles; armed with stout curved hairs; there are from one to two very long hairs on the lateral prominences of each segment and also several short ones. The terminal segment without anal spines but armed with several very long curved hairs. Antennæ stout, clothed with hairs, gradually tapering, terminal joint about as long as the two preceeding ones, obtuse at the end. Eye patches prominent, situated directly behind the antennæ in the middle of each lateral half of the head, ocelli eight on each side of the head. Legs stout; upper claw large and broad at the base for the length; a single small tooth on the inner margin about one-third from the end. Inferior claw very slender, about two-thirds as long as the superior, ending in a slender point; tenent hair single, stout, fully twice as long as the superior claw and slightly bulbous at the end; furcula short and stout.

Described from eight specimens found on bark in the woods at Poronal, Me., May, 1899, by O. O. Stover, of the Senior Class of the University of Maine.

Characterized by the slender form, absence of anal spines, peculiar color pattern, tubercled body, long hairs on the body, structure of the claws and the furcula.

Remarks.—So far as we know an *Achorutes* without anal spines has not been described from the United States. The figure shows the form too broad for the length, because of flattening in mounting. The outlines were made with a camera lucida. No attempt is made to show the peculiar mottled and striped appearance, but only the location of the long hairs.

Isotoma ——— n. sp.?

White throughout, clothed with long, straight, pointed hairs; apparently *blind*, at least no eye patches; body elongated, giving one the impression

of *Lipura;* thorax particularly long; antennæ about as long as the head, the three proximal joints about equal, the terminal nearly as long as the others together; legs short; the claws without teeth, the inferior claw not dilated at the base; elater not reaching the vertical tube, the dentes twice as long as the manubrium and very slender, the manubrium reaching a little beyond the abdomen; mucrones with two teeth, the terminal hooked, the second longer and vertical.

Found in moss in the woods, Orono, Me., April, 1899, by F. L. Harvey.

Remarks.—This species reminds one of *I. nivalis* and *albella* Packard, but it cannot be either.

It differs from *I. nivalis* in having the first tooth of the mucrone curved, dentes twice as long as manubrium instead of slightly longer, and the manubrium extending beyond the body; there is no tooth on the inner margin of the superior claw.

It differs from *I. albella* Pack. in not having eye patches, the lower claw is lanceolate and not dilated at the base and the mucrones have only two teeth.

If our diagnosis is correct, this species would, following Mac Gillivray, be related to *I. parva* Mac G., from which it differs in color and in having the claw not dilated in the middle. (The second and third antennal segments are dilated at the apex as in this species.)

EXPLANATION OF PLATE XV.

Fig. 1. *Achorutes tigrina* n. sp., dorsal view.

Figs. 2–4. *Entomobrya aglis* n. sp. 2, side view of the insect; 3, the foot enlarged showing structure of the claws and the tenent hair; 4, side view of a mucrone, showing also the coarse hairs at the tip of the dens.

Fig. 5. Genus? sp.? side view of the insect.

Figs. 6–9. *Smynthurus brunneus* n. sp. 6, the catch; 7, dentes and mucrones; 8, foot and claws; 9, side view of the insect.

COELIOXYS 8-DENTATA AND ITS HOST.—Although it has been long known that the bee-genus *Coelioxys* is parasitic on bees of the genus *Megachile*, yet none of the many American species have been hitherto bred from the cells of the latter, our knowledge of the parasites having come from observations on European species. During the past Summer I received from Dr. Henry C. McCook several cells of the leaf-cutting bee, *Megachile mendica* Cresson, from which there emerged in due time four female host-bees, and one female specimen of *Coelioxys octodentata* Say.—WILLIAM J. FOX.

Notes on Some N. A. Geometrina and Pyralidina.

By Geo. D. Hulst.

GEOMETRINA.

(Continued from p. 531, Vol xi, No. 7.)

It is a matter of interest that Mr. Aurivilius, of Sweden, has, from a study of the type of Fabricius, ascertained that *Phalæna ærata* Fabr. is the same as *Synchlora glaucata* Guen. (*rubivora* Riley). Fabricius described another N. A. species as *Phalæna bicolorata*, which is not yet determined, but may be *Cymatophora distriburaria* Hubn. But as Fabricius had already described a *Phalæna bicolorata* from South Ameria, his name in any event falls for the American insect.

Mr. Cross wrote me that, at my request, he had made an examination of certain types of Dr. Packard. He considers *Asthena brunneifasciata* Pack., as at best, a variety of *Asthena albifera* Walk. (*albogilvaria* Morr.). He also does not consider *Boarmia polygrammaria* Pack. a good species, and is also of the opinion that *Endropia apiciaria* Pack. and *Endropia pilosaria* are variations of the same species.

I would like just here to give my testimony to the character and worth of Mr. Edward Winslow Cross, who, a few months since, came to an untimely end. He was a young man of great refinement and culture, and did his work thoroughly and patiently. He had in him, by education and tendency, the making of one of the best of entomologists, as by nature he had in him the making of one of the noblest. The science met with a very great loss in his passing away from us.

Prof. Forbes' Rept. State Ent., Ills., xiv, 95, 1885, describes an insect as *Biston upsilon*. Not long since my attention was called to this description, and Prof. Forbes very kindly sent me material for study. I find it is the insect afterwards described by me as *Nacophora carlotta*. Whether there are any more descriptions of Geometers buried in the myriads of State, personal and Experiment Station Reports, I do not know. If original descriptions are made in such reports it would seem some note of the fact ought to be made in some regularly issued scientific journal, or better, a duplicate description be given there. This insect does not seem to be uncommon in

Illinois, and Prof. Lugger reports it as fairly common in Minnesota. My own types came from Charlotte Harbor, Fla.

From an examination of a number of specimens I am now of the opinion that *Eustroma cunigeratum* Walk. and *E. explanatum* Walk. are distinct species.

Having received specimens of *Hypsipetes albifasciata* Pack., which Dr. Packard puts as a variety of *Hydriomena sordidata* Fabr., I consider it not only specifically but generically distinct. It belongs to *Enchoria* Hulst.

In Staudinger's Catalogue, No. 2686, p. 189, 1871, we have a species catalogued without description as *Cidaria lugubrata* Staud. It is the same as the *luctuata* of authors, but that is not the *luctuata* of Hubner. But Moeschler had previous to this, named a variety from Labrador as *Cidaria obductata*. This last name was, therefore, the first name given to the species. It seems the species ought, therefore, to be catalogued *Cidaria obducta* Moesch., with Staudinger's form as the variety.

In Rho. Het. N. A., Suppl. II, Dr. Strecker publishes quite a number of new species of Geometers. How many of these are good species I am unable to say. *Geometra bellonaria* is, I am certain, a synonym of *Aplodes obliqua* Hulst. *Sicya faustinaria* is a variation of *S. macularia* Harr. Whether it is exactly covered by any of the variations described by Guenee I cannot say. *Marmopteryx topazata* is a good species, but belongs not to *Marmopteryx* but *Cœnocalpe* Hubn.

I have elsewhere suggested that *Acidalia frigidaria* Moesch. was a variation of *A. inductata* Guen., but, as I have since learned, without sufficient reason. Having now males of both species, I find, though very like each other in form and color, the males distinctly differ in structure.

Having received a ♂ of *Racheospila xysteraria* Hulst, I find it is a *Synchlora*.

I have also a ♂ *Selidosema correllatum* Hulst, which shows it should be catalogued under *Cleora* Curt.

I have received from the National Museum a specimen of *Endropia bilineata* Pack., with a label in, I believe, Prof. Fitch's handwriting upon it, marked, *Endropia johnsonaria* Fitch. So it may be considered settled that the two species are the same, Fitch's name having priority.

I have come to the conclusion that *Bronchelia hortaria* Fab. must be placed as a synonym of *Phalæna virginiaria* Cram.; that *Ephyra pendulinaria* Guen. is the same as *Arrhrostia lumenaria* Hubn.; that *Eumacaria brunneata* Pack. is one with *Hypargytis pustularia* Hubn.; and that *Acidalia reconditaria* Walk. (known commonly as *A. enucleata* Guen., which it is not), is the same as *Eulepidotis alabastaria* Hubn.

While there is some difference between the types, I have concluded that *Diastictis subacuta* Hulst and *Macaria respersata* Hulst are the same; that *Thamnonoma pervolata* Hulst and *Phasiane hebitata* are the same, that *Phasiane mellistrigata* Grt. and *Phasiane trifasciata* Pack. are the same. There will almost surely be a uniting of more species, as more abundant material is obtained.

Mr. Hanham, of Winnipeg, writes me that *Eois inductata* Guen. is double brooded in that locality.

Mr. Bruce says of *Eucrostis viridipennata* Hulst, "it is common on a boggy tract of land in Park Co., Col., at about 9000 feet altitude. It apparently feeds on *Potentilla*, as I always beat it from that plant. The green is dark, but so fugitive, that it always turns yellow in dampening. They must be spread before they are stiff or the color is gone."

Mr. Bruce says of *Melamæa magdalena* Hulst, that it flies around the tops of pines at high elevation (10,000 feet), and is extremely difficult to get, as it seldom flies low enough for the net. It flies by day.

Mr. Cockerell, writing from southern New Mexico, tells me "the larva of *Euephyra serrulata* Pack. was found on heads of *Bigelovia gracilens* var., at the beginning of October. It emerged in the early part of November. The larva was uncertain, as two or three kinds were mixed, but I think the larva which was of this species was entirely orange yellow, the color of the flowers."

Dr. Kunze writes me of *Emplocia cephisaria* Grt. "My specimens were all taken in the San Francisco Mountains, Ariz., in bright sunshine, rifling the flowers of *Wyethia* sp. and *Rudbeckia lanceolata*, the most at an elevation of 8600 feet, some as high as 9500 feet. I saw them on no other flowers. They were taken between July 19th and August 2d. Both this and

Gnophela hopferi feed on *Wyethia*. This (the *Emplocia*) is a shy insect and keeps a weather eye open for pursuers."

Dr. Prime tells me that *Sicya macularia* Harr. has not been found by him, except very rarely, and then only one year, at Franconia, N. H., where his summer home is. But at his "Cabin," as he calls it, some 1500 or 2000 feet higher on the mountain, near the notch, the insect appears suddenly about the middle of August, and in about a week disappears just as suddenly. It comes in myriads, so that, as it is attracted by the light, it is impossible to read or write owing to the multitudes fluttering about, and the walls and ceiling of the room are covered and literally made yellow by the moths at rest upon them.

PYRALIDINA.

Sir George F. Hampson has published a classification of the *Pyralidina* of the world, which is of great interest to all who have to do with these insects. It is difficult, however, to make much of a comparison, as his genera are rarely or never fonnded upon what is peculiar to one sex only. His subgenera, therefore, correspond pretty fairly to our genera. He brings out one new point in the synonomy that *Toripalpus* Grt. is the same as *Jocara* Walk.

From Mr. Hampson I have had a number of determinations of species. He is of the opinion that *Moodna pelviculella* Hulst equals *Manhatta lugubrella* Rag. The genus is a good one. Ragonot had the female only.

Unadilla nasutella Hulst is a synonym of *Unadilla erronella* Zell.

Mr. Hampson thinks *Atascosa bicolorella* Hulst is a synonym of *Saluria glareosella* Zell. But if Ragonot's description of his genus *Saluria* is correct, the species are not only not the same but are in different genera. *Atascosa* has 11 veins in the forewings, while *Saluria* has 10 only. In his new classification, which will be published in Volume II of the Phycitidæ of the World, Ragonot will place *glareocella* under *Poujadia* Rag. But in *Atascosa* the antennæ of ♂ are hardly crenulate, are bent above base, and have scale tuft. In *Poujadia* they are strongly crenulate, sometimes pectinate, bent above base, with

a tuft of scales in the bend. In *Atascosa* the maxillary palpi are prominent, but not hair tufted; in *Poujadia* they are hair tufted. In *Atascosa*, in hind wings, vein 2 is at the angle; in *Poujadia*, vein 2 is distant from angle. The two genera seem thus to be well separated, and it is hardly possible the species can be the same, unless Ragonot has incorrectly diagnosed *glareosella;* if the species are the same *Atascosa* ought to stand.

Mr. Hampson also says *Wekiva nodosella* Hulst and *Hypsotropa luteicostella* Rag. are the same, but here is another difficulty. *Wekiva* has palpi erect, *Hypsotropa* has them ascending; *Wekiva* has antennæ slightly bent, with tuft of scales in bend, *Hypsotropa* has antennæ bent, but without tuft of scales; *Wekiva* has ocelli, *Hypsotropa* has none; *Wekiva* has, in hind wings, 7 and 8 stemmed, in *Hypsotropa* they are not stemmed in the type. As to the species *nodosella* has costal streak reaching apex, *luteicostella* has not, though this may not be a specific distinction. But I would surely not yet join the species as yet.

I have a ♂ of *Myelois fructetella* Hulst, and find it to be an *Acrobasis*.

Acrobasis gulosella Hulst is a synonym of *Pinipestis albovittella* Hulst.

Dioryctria brucei Hulst is a synonym of *Ambesa lallatalis* Hulst.

I have from the National Museum a specimen of *Manhatta obtusangulella* Rag. without locality, bred by Prof. Riley, which has on it a label stating it was bred from a larva found in seed heads of *Rhus copallina*. In the Proc. Acad. Nat. Sci., Phil., 206, 1860, Dr Clemens described *Ephestia ostrinella*. In connection with the description he says, "the larva lives in the fruit heads of Sumach passing the winter in the larval state." As far as it goes, Dr. Clemens' description of imago applies well enough to *Manhatta obtusangulella* Rag. His type is lost, but taking description and larval history together, I think we are warranted in considering that *Ephestia ostrinella* Clem. and *Manhatta obtusangulella* Rag. are the same.

Myelois immundella Hulst is the same as *M. bilineatella* Rag.

Two New Species of Troctes.

By NATHAN BANKS.

Our common *Troctes divinatorius* (Atropos) for years remained the sole representative of this genus in this country. In 1883, however, Mr. Aaron, in the Trans. Am. Ent. Soc., described another form, *T. purpurea*, found running over papers in Philadelphia. This species has the middle femora much larger than the fore femora and almost as large as the hind femora, while in *T. divinatorius*, as in the two following species, the fore and middle femora are subequal and much smaller than the hind femora. I have not seen Aaron's species, and it may not be congeneric with *T. divinatorius*. Both of these forms are associated with houses, but the two new species described below are out-of-door forms. Doubtless there are many other species in the country, but it will be a long while before collectors gather them.

The four known species may be tabulated as follow:

1. Middle femora much longer than fore femora, body reddish..**purpurea.**
   Middle and fore femora subequal. . . . . 2.
2. Head and abdomen dark, thorax yellow, tooth on hind femur scarcely developed . . . . . **bicolor.**
   Nearly unicolorus, a tooth near base of hind femur . . . . . 3.
3. Color blackish, tooth blunt . . . . . **niger.**
   Color pale, tooth quite sharp . . . . . **divinatorius.**

Troctes bicolor n. sp.

Head shining brown to almost black; abdomen the same, although a little paler; thorax clear yellow; antennæ brown on bases, paler toward tips; legs brown or nearly black; tarsi and most of tibiæ pale; sternum and under side of head yellow; venter dull yellowish, darker at tip.

Head rather quadrate, slightly emarginate on the vertex; clypeus (nasus) very prominent; eyes small, situate just above bases of antennæ. Antennæ nearly as long as the body, two large basal joints, then six long slender subequal joints, each about five times as long as broad, then five joints much shorter and subequal, each about two and one-half or three times as long as broad, then an apical joint rather longer than any of the last five. Prothorax transverse, trilobed in front; meso- and metanotum united in a flat plate, which is only slightly broader than long, broader behind than in front, and with a median suture on the anterior part.

Abdomen about two and one-half times as long as broad, depressed, truncate at base, slightly broader in the middle, and broadly rounded behind. Each segment shows a rather darker transverse mark on the

base. Body with scattered short white hairs, some longer and finer ones near tip of abdomen. Femora 1 and 2 about as long as width of the prothorax, slightly enlarged; hind femora as long as abdomen is broad at base, much swollen, shining, with a few hairs, and scarcely a trace of the tooth near base.

Length 1 mm.

This handsome species is described from many specimens found running over dry boards at Falls Church, Virginia, June, 1899. They hide in the cracks and walk out leisurely enough, but if disturbed run with amazing swiftness so that they are difficult of capture. They did not jump.

Trogtes niger n. sp.

Whole body dull blackish; antennæ paler at tips; tarsi and part of tibia also pale; sternum dark; venter pale brown; head rather darker than abdomen, which is darkest on the margins; legs brown.

Head broad, slightly rounded on the sides; nasus not very prominent; head with scattered short pale hairs; eyes small. Antennæ like the preceding species. Prothorax transverse, trilobate in front; meso- and metathorax in one shield, faintly rugose, broader than long and narrower in front, with an oblique impression each side and a median suture on the fore part. Abdomen truncate at base, plainly broader in middle, and broadly rounded behind, with many short erect scattered white hairs, a few larger ones behind. Legs as in *T. bicolor;* hind femur with an obtuse tooth on outside above at greatest part of swelling.

Length .9 mm.

Several specimens found on the under side of dead and decaying logs in woods near Falls Church, Virginia, June. They did not run very rapidly when disturbed and did not jump.

THE University of the State of Missouri has sent an entomological expedition into Southern Mexico this past Summer. It was in charge of Prof. J. M. Stedman, head of the Entomological Department, and had for its object the making of a biological, largely entomological, survey of the region from Vera Cruz on the Gulf, which is in perpetual tropics, to the top of the volcano Popocatepetl, which is far above the perpetual snow line, and down to Acapulco on the Pacific. This will give all the temperature variations from perpetual tropics to perpetual snow, and will allow of the study of life zones under conditions not to be found elsewhere in North America. The collection will become the property of the University, which is to furnish half the expenses, the other half to be borne by Prof. Stedman.

Coleopterous Fauna of Phoenix, Arizona, and Surrounding Regions.

H. G. GRIFFITH, M.D., Philadelphia.

The Salt River Valley of Arizona, that part of it in which we were interested, is about 60 miles in length, with an average width of 15 miles.

The elevation is about 1200 feet above sea-level, surface even, with an inclination of about 10 feet to the mile.

It is surrounded by mountains, some of which are lofty and quite picturesque.

In the valley proper the soil is a rich alluvium of varying depths, and by irrigation produces a variety of crops in great abundance.

Like all the arid regions of the west, there is a variety of climates; the summer heat sets in early, is intense and long lasting, but not accompanied with any of the pernicious effects noticed in localities nearer the seaboard. The winters are usually mild. The dryness of the atmosphere is perpetual, and all animal and vegetable matters rapidy dessicate.

The soils of the desert are of decomposed granitic and lava rock mixed with sand and markedly alkaline, while the mesas or table lands are composed of rocks and boulders covered with a veneer of soil.

Central and southern Arizona has a flora peculiar to itself. The cacti, yuccas and agavas are the most prominent. The plains are thickly covered with a great variety of shrubs and bushes; the grease-wood growing on the driest of the deserts, is the most conspicuous shrub.

Along the water-courses are a variety of trees, the mesquite, cottonwood, willow, sycamore and ash. At first sight there seems to be much of a sameness in the flora of the plains; the uniform sage-green character of the foliage, with a preponderance of red and yellow flowers would suggest a limited flora.

Close examination gives a number and variety of genera and species that is almost a wonder; what to-day is a boundless barren sand waste, when irrigated by a passing shower soon bursts into full floral beauty and we wonder at the productiveness of the soil.

The timber is confined to the ranges and water-courses, while scattered growths of mesquite and palo-verde cover the foot-hills and isolated places on the plains.

Leaving the cultivated portion of the valley, we see the true character of the country; long level stretches covered with grease-wood under whose shelter many rare and delicate forms of plant life grow.

As the country becomes more broken we reach the cacti zone where we find ourselves in a veritable forest of these curiosities of plant life.

Yuccas, an occasional pine and stunted oaks appear, but all about you denotes the absence of the one great factor for the welfare of this wonderful country—water.

The rains come at last, the desert blossoms, and with the flowers come the insects, showing us a wealth of life that is truly wonderful.

Thus in brief we have an idea of the physical condition of the country.

The principal town of the region is Phœnix; in making our collecting excursions it was our headquarters. Being a dry season, with about one-tenth of an inch of rain in ten months, and most of the collecting done from October to May, the conditions were not favorable to represent the fauna, but the series gives an idea of its extent.

As will be seen by the subjoined list, there is commingling of the fauna of the North with the Sonoran fauna of Mexico.

As civilization advances, and larger areas of desert lands are reclaimed by irrigation, climatic changes will take place, forcing the desert fauna to recede southward or become extinct, so that collections made in future years will show marked changes from those recorded by LeConte, Horn, Hubbard, Schwarz, Wickham and others.

Of the immediate habits of the insects little is known except of such forms as occur elsewhere. *Cyllene antennatus* and *Trogosita virescens* inhabit the mesquite and prove very destructive.

In the most barren part of the desert we find *Edrotes ventricosus*, which are always in a hurry, though only to be found in the early hours, hiding in their burrows during the heat of mid-day.

Eleodes armata, longicollis and some others move with a slow, majestic stride; when touched, they elevate the abdomen, walking off, apparently, on their heads; the name "kangaroo bugs" has been applied to them by the ranchmen.

Asidas are retiring and found, as a rule, under some protecting material.

Hololepta yucateca was found abundantly in decomposing *Cereus giganteus*, while *H. cacti* seemed to be a strange to the region.

Chilcorus cacti always found on old mesquite trees which are badly infested with various scale insects.

Many forms of Tenebrionidæ are nocturnal in their habits; the intense heat of day often kills them when almost in their burrows. This we saw in many instances in the sandy bottoms along the Rio Verde.

Curious tracks left in the sand by beetles at once attract the eye; *Eusattus muricatus* will leave their marks of characteristic appearance. The larger *Eleodes* making similar ones but longer, and by following these we were able to locate their burrows.

Those of *Dinocleus* differ somewhat, the tarsal joints bending inward to help them along, and they are always to be found about the roots of plants.

Cicindela guttifera found on wet sand along the Rio Verde, very wild and unassociated with any other species.

Allorhina mutabilis proves a great menace to the horticulturist, the fruit trees seeming alive with them.

Cotalpa consobrina is another pest, some seasons appearing in vast numbers.

The young willow shoots gave us *Chalcolepidius webbii, behrensii* and *tartarus*, without any of the unpleasant experiences of Wickham and others.

Hippomelas sphenicus we found in November, and so closely does it resemble the branches of the mesquite that it requires close searching to find them.

Flushing the banks of streams with water furnished many species of riparian beetles, but the larger number were taken at the electric light, as were the majority of Staphylinidæ.

One of the best captures at lights was a specimen of *Achryson surinamum*, which is found more commonly in South America.

The decomposing tissues of the giant cactus forms a veritable mine of insects, in such numbers that one is astonished.

There does not appear to be any limit to the collecting season, each month furnishing additional species. The acme of collecting is from May to August, when, however, the intense heat renders field work very trying.

The requisites for collecting in this country are a good team to take you from point to point, a strong canvas net capable of resisting the thorns and spikes with which all vegetation is covered, a very long pair of metal forceps to reach specimens concealed between the spines of cacti; and the always imperative canteen of water.

I have refrained from using the terms rare or scarce as from personal observation; if one collects at the right time our rarities would become common. To illustrate: on May 10th, on the desert northeast of Mesa, just at dusk, with a storm threatening, the air seemed suddenly alive with a whirring mass of insects, flying about the grease-wood, which was in full bloom. In the short time allowed before the storm broke we collected as many as possible, and found to our delight the hitherto rare Tenebrionid—*Cnemodus testaceus*.

I may safely say thousands could have been taken at the time, but the most careful search afterwards under similar conditions failed to discover any; such was our observation of many other forms, and it is a safe rule to take advantage of these opportunities, as others infrequently occur.

For the localities mentioned in the appended list, Phoenix being the center, the Salt River, up and down for several miles, is from one to two miles south. Tempe Desert, northeast from Tempe for many miles. Mesa, east of Tempe eight miles and the surrounding country. Rio Verde, northeast from Phoenix fifty miles, all collecting done on east side of river from Mr. Latterett's ranch.

For a long time to come collectors may visit this region with profit to themselves, and be delighted with acquiring material under new and strange conditions. Had my health permitted

more active collecting, the series would have been much extended and been a truer exponent of the fauna.

In preparing the list I am indebted to Chas. Liebeck for the bulk of the assorting and determinations, and also to H. C. Fall, of Pasadena, Cal., for much assistance.

LIST OF SPECIES.*

CICINDELIDÆ.

Tetracha carolina *Linn.*, Ph.
Cicindela guttifera *Lec.*, R. V.
micans *Fab.*, Ph.
lemniscata *Lec.*, Ph.
prætextata *Lec.*, Ph.

CARABIDÆ.

Omophron gilæ *Lec.*, Ph.
Calosoma prominens *Lec.*, Ph.
triste *Lec.*, Ph., T. D.
Scarites subterraneus *Fab.*, Ph.
Dyschirius truncatus *Lec.* Ph.
sp. S. R.
Clivina ferrea *Lec.*, S. R.
bipustulata *Fab.* var. R. V., S. R.
Schizogenius crenulatus *Lec.*, S. R.
depressus *Lec.*, Ph., R. V., S. R.
n. sp., S. R.
Bembidium transversale *Dej.*, Ph., S. R.
lugubre *Lec.*, Ph.
striola *Lec.*, Ph.
nubiculosum *Chaud.*, Ph.
timidum *Lec.*, Ph , S.R.
versicolor *Lec.*, Ph., S. R.
scintillans *Bates*, Ph.
Tachys rapax *Lec.*, S. R.
audax *Lec.*, R. V.
trechiformis *Hayw.*, R. V.
Pericompsus sellatus *Lec.*, Ph.
Pterostichus subcordatus *Lec.*, Ph., R. V.
Amara jacobinæ *Lec.*, Ph.
Amara californica *Dej.*, Ph.
gibba *Lec.*, Ph., R. V.
Platynus nutans *Say.*, Ph.
punctiformis *Say.*, Ph., R. V.
sp., Ph., R. V.
Lachnophorus elegantulus Mann., Ph.
Thalpius Horni *Chd.*, Ph.
Ega lætula *Lec.*, S. R.
Tetragonoderus fasciatus *Hld.*, Ph.
pallidus *Horn*, R. V.
Lebia guttula *Lec.*, S. R.
bivittata *Fab* , Ph.
Apristus subsulcatus *Dej.*, Ph., R.V.
Blechrus nigrinus *Mann.*, S. R.
Axinopalpus fusciceps *Lec.*, S. R.
Callida platynoides *Horn*, R. V.
Cymindis laticollis *Say*, Ph.
n. sp., Ph.
Apenes nebulosa *Lec.*, Ph.
Helluomorpha ferruginea *Lec.*, Ph.
Brachynus Tchernikhii *Mann.*, ? R. V., S. A.
carinulatus *Mots.*, ? Ph., R.V.
Chlænius sericeus *Forst.* var. R.V.
leucoscelis *Chev.*, R.V., S. R.
Oodes elegans *Lec.*, S. R.
Piosoma setosum *Lec.*, Ph.
Agonoderus lineola *Fab.*, R. V.
pallipes *Fab.*, Ph.
Discoderus impotens *Lec.*, Ph., R.V.
robustus *Horn.*, Ph., R. V.
amoenus *Lec.*, ? Ph., R. V.
sp., R. V.
cordicollis *Horn*, Ph., R. V

* Abbreviations for localities :—Ph., Phoenix ; S. R., Salt River; R. V., Rio Verde; T. D., Tempe Desert.

Stenomorphus rufipes *Lec.*, Ph.
Harpalus caliginosus *Fab.*, Ph.
pennsylvanicus *Dej.*, Ph.
Selenophorus palliatus *Lec.*, Ph., S. R.
pedicularius *Dej.*, Ph., R. V., S. R.
Stenolophus cincticollis *Lec.*, Ph., R. V.
ochropezus *Say.*, Ph.
Bradycellus rivalis *Lec.*, ? Ph.
Anisotarsus flebilis *Lec.*, Ph.
sp., Ph., R. V.
Pseudomorpha angustata *Horn.*, R. V.

HALIPLIDÆ.

Cnemidotus callosus *Lec.*, Ph.

DYTISCIDÆ.

Laccophilus decipiens *Lec.*, Ph.
mexicanus *Aube.*, Ph.
Bidessus cinctellus *Lec.*, Ph.
Hydroporus sp., Ph.
sp., Ph.
Copelatus chevrolatii *Aube.*, Ph.
Agabus lugens *Lec.*, Ph.
semivittatus *Lec.*, R. V.
Eretes sticticus *Linn.*, Ph.
Thermonectes latecincta *Lec.*, Ph.
Cybister explanatus *Lec.*, Ph.

HYDROPHILIDÆ.

Helophorus lineatus *Say.*, Ph.
Hydrophilus triangularis *Say.*, Ph.
limbalis *Lec.*, Ph.
ellipticus *Lec.*, Ph.
Berosus exilis *Lec.*, Ph.
infuscatus *Lec.*, Ph.
Chætarthria pallida *Lec.*, Ph.
Laccobius agilis *Rand.*, Ph.
Philydrus pectoralis *Lec.*, Ph.
Cercyon capillatum *Lec.*, T. D.
Dactylosternum cacti *Lec.*, T. D.

SILPHIDÆ.

Necrophorus Melsheimeri *Kby.*, Ph.

STAPHYLINIDÆ.

Homalota semiopaca *Fvl.*, R. V., S. R.
sp., R. V.
Aleochara bimaculata *Grav.*, Ph.
nitida *Grav.*, R. V.
sp., Ph.
Maseochara semivelutina *Sol.*, T. D.
opacella *Sharp*, R. V., T. D.
Heterothops occidentis *Cas.*, Ph.
Quedius desertus *Horn*, Ph.
Creophilus villosus *Grav.*, R. V.
Xanthopygus cacti *Horn.*, T. D.
Staphylinus sp., Ph.
Belonuchus ephippiatus *Say*, T. D.
Philonthus semiruber *Horn*, Ph., R. V.
hepaticus *Er.*, Ph.
flavolimbatus *Er.*, S. R.
grandicollis *Horn*, Ph.
longicornis *Steph.*, S. R.
alumnus *Er.* var. Ph., R. V.
lomatus *Er.* var. R. V., S. R.
quadrulus *Horn*, R. V.
Actobius gratus *Lec.*, R. V., S. R.
pæderoides *Lec.*, R. V.
elegantulus *Horn*, R. V.
Xantholinus dimidiatus *Lec.*, Ph., R. V.
sp., Ph.
Cryptobium pimerianum *Lec.*, Ph., R. V.
arizonense *Horn*, Ph.
prospiciens *Lec.*, Ph.
Lathrobium lituarium *Lec.*, Ph.
Lithocharis tabacina *Cas.*, R. V., T. D.
Pæderus femoralis *Lec.*, S. R.
Pinophilus densus *Lec.*, Ph., S. R.
Physetoporus grossulus *Lec.*, T. D., R. V.
Erchomus punctipennis *Lec.*, Ph.
Bledius flavipennis *Lec.*, R. V.
sp., Ph.
Platystethus americanus *Er.*, R.V.
Oxytelus sp., R. V.
Apocellus sp., S. R., R. V.

COCCINELLIDÆ.

Megilla maculata *DeG.*, Ph.
Hippodamia convergens *Guer.*, Ph.
Coccinella abdominalis *Say.*, Ph.
Chilocorus cacti *Linn.*, Ph., T. D.
Exochomus marginipennis *Lec.*, Ph.
Hyperaspis lugubris *Rand.*, Ph.
Scymnus ardelis *Horn.*, Ph.

ENDOMYCHIDÆ.

Epipocus unicolor *Horn*, Ph.

COLYDIIDÆ.

Ditoma ornata *Lec.*, Ph.
sulcata *Lec.*, Ph.
Phloeonemus catenulatus *Horn.*, Ph.

CUCUJIDÆ.

Silvanus nitidulus *Lec.*, Ph.
advena *Waltl.*, Ph.
sp., Ph.

CRYPTOPHAGIDÆ.

Cryptophagus sp., Ph.

MYCETOPHAGIDÆ.

Litargus balteatus *Lec.*, Ph.
Typhoea fumata *Linn.*, Ph.

DERMESTIDÆ.

Dermestes marmoratus *Say*, T. D.
Mannerheimi *Lec.*, T. D.
caninus *Germ.*, Mesa.
vulpinus *Fab.*, Ph., R. V.
Attagenus Horni *Jayne*, Ph.
varicolor *Jayne*, Ph.
Trogoderme sternale *Jayne*, Ph.
Cryptorhopalum balteatum *Lec.*, Ph.
apicale *Mann.*, Ph.
triste *Lec.*, ? Ph.

HISTERIDÆ.

Hololepta yucateca *Mars.*, T. D.
populnea *Lec.*, Ph.
Hister servus *Er.*, Ph.
Epierus regularis *Beauv.*, Ph.
planulus *Er.*, Ph.
nasutus *Horn*, Ph.
Paromalus gilensis *Lec.*, Ph.
Saprinus obscurus *Lec.*, Ph.
lugens *Er.*, Ph.
pennsylvanicus *Payk.*, Ph.
vitiosus *Lec.*, Ph., Mesa.
sp., Mesa.
cærulescens *Lec.*, Mesa.

NITIDULIDÆ.

Carpophilus hemipterus *Linn.*, Ph.
pallipennis *Say*, Ph., T. D.
floralis ? Ph., Mesa.
discoideus *Lec.*, Ph.

TROGOSITIDÆ.

Trogosita virescens *Fab.*, Ph.
Alindria teres *Melsh*, Ph.
Tenebrioides sp., Ph.

BYRRHIDÆ.

Limnichus analis *Lec.*, Ph.

HETEROCERIDÆ.

Heterocerus collaris *Kies.*, Ph.
pallidus *Say*, Ph.
pusillus *Say*, Ph.

DASCYLLIDÆ.

Anorus parvicollis *Horn*, Ph.

ELATERIDÆ.

Anelastes Latreillei *Lec.*, Ph.
Chalcolepidius Webbii *Lec.*, Ph.
tartarus *Fall*, Ph.
Behrensii *Cand.*, Ph.
Horistonotus simplex *Lec.*, Ph.
Esthesopus dispersus *Horn*, Ph.
sp., Ph.
Anchastus bicolor *Lec.*, Ph.
Monocepidius robustus *Horn*, Ph.
Discrepidius corvinus *Cand.*, Ph.
Drasterius livens *Lec.*, Ph.
Ludius texanus *Lec.*, Ph.
Melanotus fissilis *Say*, Ph.

BUPRESTIDÆ.

Hippomelas sphenicus *Lec.*, Ph.
Chrysobothris octocola *Lec.*, Ph.
debilis *Lec.*, Ph.
lixa *Horn*, Ph.
Acmæodera ornata *Fab.*, T. D.
cuneata *Fall*, T. D., R. V.
acuta *Lec.*, T. D.
Griffithii *Fall*, T. D.
Agrilus felix *Horn*, Ph.
palmacollis *Horn*, Ph.

LAMPYRIDÆ.

Lycus cruentatus *Lec.*, T. D.
Lycaina marginatus *Gorh.*, Ph.
Pyropyga fenestralis *Melsh.*, Ph.
Mastinocerus opaculus *Horn*, Ph.
Chauliognathus scutellaris *Lec.*, Ph.

MALACHIDÆ.

Collops 4-maculatus *Fab.*, Ph.
pulchellus *Horn*, Ph.
vittatus *Say*, Ph.
Attalus oregonensis *Horn*, ? T. D.
rufiventris *Horn*, T. D.
circumscriptus *Say*, T. D.
cinctus *Lec.*, T. D.
lobulatus *Lec.*, T. D.
sp., T. D.
Pristoscelis umbratus *Lec.*, T. D.
propinquus *Cas.*, T. D.
four species indet, T. D.
Listrus impressus *Chev.*, T. D.
ferrugineus *Chev.*, T. D.
Pseudallonyx plumbeus *Lec.*, T.D.
sp., T. D.
Allonyx sp., T. D.
Rhadalus testaceus *Lec.*, Ph.

CLERIDÆ.

Cymatodera puncticollis *Bland.*, Ph.
californica *Horn*, Ph.
Belfragei *Horn*, Ph.
oblita *Horn*, Ph.
Trichodes ornatus *Say*, Mesa.
Hydnocera discoidea *Lec.*, Ph.
pallipennis *Say*, var. Ph.
Necrobia rufipes *Fab.*, T.D., R.V., Ph.

PTINIDÆ.

Catorama sp., Ph.
Hemiptychus punctatus *Lec.*, Ph.
pusillus *Lec.*, Ph.
Sinoxylon sericans *Lec.*, Ph.
sextuberculatum *Lec.*, Ph.
quadrispinosum *Lec.*, Ph.
Amphicerus fortis *Lec.*, Ph.
punctipennis *Lec.*, Ph.

SCARABÆIDÆ.

Canthon puncticollis *Lec.*, R. V.
simplex *Lec.*, Ph.
corvinus *Horn*, Ph.
Psammodius nanus *Horn*, Ph.
Atænius desertus *Horn*, Ph.
gracilis *Melsh.*, Ph.
Haroldi *Steinh.*, Ph.
læviventris *Horn*, Ph.
Aphodius granarius *Linn.*, Ph.
vittatus *Say*, Ph., R. V.
lividus *Oliv.*, Ph.
rubiginosus *Horn*, Ph.
rubidus *Lec.*, Ph.
larræa *Horn*, Ph.
Ochodæus sparsus *Lec.*, Ph.
Pachyplectrus lævis *Lec.*, R. V.
Bradycinetus serratus *Lec.*, Ph.
Trox suberosus *Fab.*, Ph.
sonoræ *Lec.*, Ph.
atrox *Lec.*, Ph.
Glaresis sp., Ph., T. D.
Acoma brunnea *Cas.*, Ph.
Diplotaxis puberula *Lec.*, Ph.
mœrens *Lec.*, Ph.
atratula *Lec.*, ? Ph.
three species indet, Ph.
Listrochelus scoparius *Lec.*, Ph.
mucoreus *Lec.*, T. D.
timidus *Horn*, Ph.
Polyphylla Hammondi *Lec.*, Ph.
Pelidnota lugubris *Lec.*, Ph.
Cotalpa consobrina *Horn*, Ph.
flavida *Horn*, Ph.
Cyclocephala immaculata *Oliv.*, Ph.
longula *Lec.*, Ph.
dimidiata *Burm.*, Ph.

Ligyrus gibbosus *DeG.*, Ph.
ruginasus *Lec.*, Ph.
Aphonides Dunniana *Rivers*, Ph.
Strategus julianus *Burm.*, ? Ph.
Dynastes Grantii *Horn*, Ph.
Phileurus illatus *Lec.*, Ph.
Allorhina mutabilis *Gory*, Ph.

CERAMBYCIDÆ.

Mallodon manibularis *Harold*, Ph.
Derobrachus geminatus *Lec.*, Ph.
Achryson surinamum *Lec.*, Ph.
Eburia n. sp., Ph.
Eustroma validum *Lec.*, Ph.
Æthecerus latecinctus *Horn*, T. D.
Crossidius intermedius *Ulke*, Ph.
Sphænothecus suturalis *Lec.*, T. D.
Ischnocnemis bivittatus *Dup.*, Ph.
Cyllene antennatus *White*, Ph.
Ataxia crypta *Say*, Ph.

CHRYSOMELIDÆ.

Euryscopa Lecontei *Cr.*, T. D.
Pachybrachys abdominalis *Say*, Ph.
sp., Ph.
Monachus Guerini *Perb.*, Ph.
Myochrous longulus *Lec.*, Ph.
Metachroma californica *Cr.*, Ph.
interrupta *Say*, Ph.
longulum *Horn*, Ph.
Colaspis brunnea *Fab.*, Ph.
Gastroidea cyanea *Melsh.*, R. V.
Malacosoma brevicorne *Jac.*, Ph.
Diabrotica 12-punctata *Oliv.*, Ph.
balteata *Lec.*, Ph., R. V.
trivittata *Mann.*, Ph.
Monoxia sordida *Lec.*, Ph.
Disonycha quinquevittata *Say*, Ph.
arizonæ *Cas.*, Ph.
Phyllotreta pusilla *Horn*, Ph.

BRUCHIDÆ.

Bruchus Ulkei *Horn*, Ph.
n. sp. Ph.
prosopis *Lec.*, Ph.
n. sp., Ph.
uniformis *Lec.*, Ph.
amicus *Horn*, Ph.

TENEBRIONIDÆ.

Edrotes ventricosus *Lec.*, T. D.
Triorophus lævis *Lec.*, T. D.
Eurymetopon rufipes *Esch.*, Ph.
dubium *Cas.*, Ph., T. D.
cylindricum *Cas.*, Ph.
serratum *Lec.*, Ph.
Emmenastus longulus *Lec.*, Ph.
punctatus *Lec.*, Ph.
subopacus *Horn*, T. D.
Cnemodus testaceus *Horn*, Mesa.
Chilometopon ? sp., R. V.
Zopherus tristis *Lec.*, T. D., Mesa.
Dacoderus striaticeps *Lec.*, Ph.
Araeoschizus decipiens *Horn*, Ph.
Cryptoglossa verrucosa *Lec.*, T. D.
Centrioptera muricata *Lec.*, R. V., T. D.
variolosa *Horn*, T. D., Ph.
Asida actuosa *Horn*, T. D.
semilævis *Horn*, T. D.
confluens *Lec.*, Ph.
parallela *Lec.*, Ph.
Wickhami *Horn*, T. D., Ph.
hispidula *Lec.*, T. D.
convexa *Lec.*, T. D.
blapsoides *Sol.*, ? T. D.
marginata *Lec.*, T. D.
n. sp , T. D.
Eusattus reticulatus *Say*, T. D.
dubius *Lec.*, Ph.
muricatus *Lec.*, R. V.
Eleodes obscura *Say*, R. V.
carbonaria var. soror *Lec.*, T. D.
obsoleta *Say*, Ph.
armata *Lec.*, T. D., R. V.
longicollis *Lec.*, R. V.
hispilabris *Say*, R. V.
Argoporis costipennis *Lec.*, T. D.
bicolor *Lec.*, T. D.
Amphidora caudata *Horn*, Ph.
Nyctobates subnitens *Horn*, Ph.
Iphthimus sublævis *Bland*, R. V.
Cœlocnemis magna *Lec.*, R. V.
Adelina Lecontei *Horn*, Ph.
Alæphus pallidus *Horn*, Ph.

Eupsophus castaneus *Lec.*, Ph.
Mecysmus angustus *Lec.*, Ph.
Blapstinus sordidus *Lec.*, Ph.
auripilus *Horn*, Ph.
dilatatus *Lec.*, Ph.
Lecontei *Muls.*, Ph.
two species indet, Ph.
Notibius gagates *Horn*. R. V.
granulatus *Lec.*, R. V., T. D.
Ulus crassus *Lec.*, Ph.
sp., Ph.
Tribolium ferrugineum *Fab.*, Ph.
Mycotrogus ? sp., Ph.
Aphanotus brevicornis *Lec.*, ? Ph.
Alphitobius diaperinus *Panz.*, Ph.
piceus *Oliv.*, Ph.
Helops arizonensis *Horn*, Ph.
Platydema janus *Fab.*, Ph.

CISTELIDÆ.

Hymenorus occidentalis *Cas.*, Ph.
punctatissimus *Lec.*, Ph.
sp. near occidentalis *Cas.*, Ph.

MONOMMIDÆ.

Hyporhagus gilensis *Horn*, R. V.

MELANDRYIIDÆ.

Eustrophus arizonensis *Horn*, Ph.
bicolor *Say*, Ph.

PYTHIDÆ.

Trimitomerus Riversii *Horn*, Ph.

ŒDEMERIDÆ.

Oxacis lucana *Lec.*, Ph.

MORDELLIDÆ.

Anaspis sp., Ph.
Mordella scutellaris *Fab.* var., Ph.
Mordellistena comata *Lec.*, Ph.
ambusta *Lec.*, Ph.
unicolor *Lec.*, Ph.

ANTHICIDÆ.

Stereopalpus sp., Ph.
Xylophilus brunnipennis *Lec.*, Ph.
Notoxus calcaratus *Horn*, Ph.
Mecynotarsus delicatulus *Horn*, Ph.
Anthicus confinis *Lec.*, Ph.
horridus *Lec.*, Ph.
quadrilunulatus *Laf.*, Ph.
two species indet, Ph.

MELOIDÆ.

Nemognatha lurida *Lec.*, Ph.
lutea *Lec.*, Ph.
bicolor *Lec.*, Ph.
dichroa *Lec.* ? Ph.
vittigera *Lec.*, Ph.
sp., Ph.
Gnathium minimum *Say*, Ph.
nitidum *Horn*, Ph.
Macrobasis longicollis *Lec.*, Ph.
virgulata *Lec.*, Ph.
tenuilineata *Horn*, Ph.
lauta *Horn*, Ph.
tenella *Lec.*, Ph.
Epicauta caviceps *Horn*, Ph.
maculata *Say*, Ph.
Wheeleri *Ulke*, Ph.
cupreola *Duges*, Ph.
two new species, Ph.
Pyrota mylabrina *Chev.*, Ph.
Akhurstiana *Horn*, Ph.
Calospasta elegans *Lec.*, R. V.
nemognathoides *Horn*, Ph.

OTIORHYNCHIDÆ.

Eupagoderes decipiens *Lec.*, Ph.
n. sp. Ph.
Eucyllus vagans *Horn*, Ph.
Cyphus lautus *Lec.*, Ph.
lautus *Lec.* var. ? Ph.

CURCULIONIDÆ.

Apion occidentalis *Fall*, Ph.
Dinocleus saginatus *Cas.*, Ph.
Dorytomus inæqualis *Cas.*, Ph.
Desmoris constrictus *Say*, Ph.
sp., Ph.
Synertha imbricata *Cas.*, Ph.
Tychius setosus *Lec.*, R. V., Mesa.
Conotrachelus seniculus *Lec.*, Ph.
Baris strenua *Lec.*, Ph.
transversa *Say*, T. D., Ph.
Onychobaris mystica *Cas.*, Ph.
Balaninus sp., Ph.

CALANDRIDÆ.

Sphenophorus sp., near placidus *Say*, Ph.

ANTHRIBIDÆ.

Brachytarsus sp., Ph.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., OCTOBER, 1900.

DURING the last ten years great progress has been made in entomological illustrative work by the aid of photography. The advantage of photographic methods is cheapness and mechanical accuracy of definition. The possibilities for improvement are still great, and the future is therefore most promising. As competition increases, the cost of the new three-color process will undoubtedly be materially lessened, and increased familiarity with this kind of work will increase its value and effectiveness. When three-color work is made from color drawings the originals should be prepared in such a manner as to produce the best results. We have lately seen some truly superb half-tone results in the illustration of moths,* and we are pleased to see that these insects are likely to be well figured in the future.† We are sorry to have seen a most miserable half-tone of moths in a recent number of an American journal of entomology. The copy was excellent, and the half-tones should have been made and printed in this city. The cost would have been the same and the result entirely different. Those who have access to the "Iris" should look at the magnificent plate mentioned.

* See "Iris," Dresden, Bd. xiii. Taf. iv.

† See Smith on *Xylina*, Trans. Am. Ent. Soc., Vol. xxvii, No 1.

Entomological Literature.

COMPILED BY P. P. CALVERT.

Under the above head it is intended to mention papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South). Articles irrelevant to American entomology will not be noted. Contributions to the anatomy, physiology and embryology of insects, however, relating to American or exotic species, will be recorded. The numbers in HEAVY-FACED TYPE refer to the journals, as numbered in the following list, in which the papers are published; * denotes that the paper in question contains descriptions of new North American forms. Titles of all articles in foreign languages are translated into English; usually such articles are written in the same language as the title of the journal containing them, but when such articles are in other languages than English, French, German or Italian, this fact is indicated in brackets.

3. The American Naturalist, Boston, '00.—**4.** The Canadian Entomologist, London, Ont., '00.—**5.** Psyche, Cambridge, Mass., '00.—**8.** The Entomologist's Monthly Magazine, London, Sept., '00.—**9.** The Entomologist, London, Sept., '00.—**15.** Biologia Centrali-Americana, London; pt clvi, June, '00; rec'd. Sept. 3.—**19.** Horæ Societatis Entomologicæ Rossicæ, xxxiv, 1-2, St. Petersburg, '00.—**22.** Zoologischer Anzeiger, Leipsic, '00.—**40.** Societas Entomologica, Zürich-Hottingen, '00.—**45.** Deutsche Entomologische Zeitschrift, 1900, Heft 1, Berlin, July.—**54.** Journal, Royal Horticultural Society, xxxiii, 3, London, Aug., '00.—**58.** Revista Chilena de Historia Natural, Valparaiso, '00.—**60c.** Comunicaciones, Museo Nacional de Buenos Aires, i, 6, May 23, '00.—**81.** Biologisches Centralblatt, Erlangen, '00.—**97.** Zeitschrift für wissenschaftliche Zoologie, Leipsic, '00.—**116.** Biological Bulletin, Boston, '00.—**135.** Verhandlungen, Gesellschaft deutscher Naturforscher und Arzte, 71 Versammlung zu München, 17-23 Sept., 1899. Zweiter Theil, 1 Hälfte, Leipsic, '00.—**136.** Stettiner Entomologische Zeitung, 58. Jahrgang, 1897; 59. Jahrgang, 1898; 60. Jahrgang, 1899. For reasons unknown to us, these volumes have heen withheld, so far at least as we in Philadelphia are concerned, until Sept, 1900.

THE GENERAL SUBJECT.—Bachmetjew, P. The dependence of the critical point in insects on their rapidity of cooling, figs., **97,** lxvii, 4, Aug. 7.—**Berg, C.** See Neuroptera.—**Berlese, A.** Considerations on phagocytosis in the metabolic insects, **22,** Aug. 20.—**Dollfuss, A.** Summary list of the collections of natural history at the Universal Exposition [Paris] (cont.), La Feuille des jeunes Naturalistes, Paris, Aug. 1, '00.—**Imhof, O. E.** Multiocellate winged insect, **81,** Aug. 1.—**Kochi, C.** The origin of the middle ocellus of the adult insect (preliminary communication), fig., **3,** Aug.—**Porter, C. E.** Memorandum de Zoologia conforme a los últimos adelantos de la Ciencia. Entrega 1 i 2. Valparaiso, Imp. Gillet, 1899. The active and zealous Director of the Chilian National Museum at Valparaiso, and Editor of the Revista Chilena de Historia Natural, has prepared this work, as "a sort of program or synoptic compendium" of his Elementary Course in Zoology now in press. It is

intended chiefly for the needs of secondary education in Chili especially, and with that end in view the examples of the various groups are selected from the S. American and Chilian faunas. Fourteen parts of the work are promised, of which eight are to be devoted to zoological classification, six to morphology and physiology. The two before us, pp. 1-40, treat of the Protozoa, Mesozoa, Sponges and Cœlenterata, and hence fall outside of the field of the NEWS. But we expect this work to increase the interest in Entomology, as in Zoology generally, in South America, and thus lead to greatly increased knowledge of that rich fauna.—**Radl, E.** On the curvature of the compound eyes of Arthropods (preliminary communication). **22,** July 9; Researches on the structure of the optic tract of *Squilla mantis* and of other Arthropods, 1 pl., **97**, lxvii, 4, Aug. 7.—**Roedel, H.** The protective defenses of insects against cold with especial reference to Prof. Bachmetjew's researches on the temperature of insects, Helios, xvii, Berlin, 1900.—**Wandolleck, B.** (Diptera), **Stadelman, H.** (Hymenoptera, Orthoptera), **Lucas, R.** (other Insects except Coleoptera, Arachnoidea). Report of the scientific results in the field of entomology during the year 1896, Archiv für Naturgeschichte, lxiii, ii, 2 Heft, 2. Hälfte, Berlin, June, 1900.

ECONOMIC ENTOMOLOGY.—Beyer, R. History of the distribution of the Grape Phylloxera in Germany, map. Naturwissenschaftliche Wochenschrift, Berlin, Aug. 5, 12, '00.—**Felt, E. P.** Fifteenth Report of the State Entomologist on injurious and other insects of the State of New York, 1899. Bulletin, N. Y. State Museum vi, No. 31, Albany, June, '00.—**Fernald, H. T.** Some insects injurious in Pennsylvania, figs. Fourth Annual Report of the Pennsylvania Dep't of Agriculture, part i. [Harrisburg] 1899.—**Fletcher, J.** Evidence of before the Select Standing Committee on Agriculture and Colonization, 1900. Printed by order of Parliament. Ottawa, 1900. (Insect pests, grasses and weeds. 45 pp.)—**Id.** Report of the Entomologist and Botanist, 1899, figs. Annual Report on Experimental Farms for the year 1899, pp. 159-204. Canada Department of Agriculture. Ottawa, 1900.—**Grassi, G. B.** The communication of malaria by mosquitoes of the genus *Anopheles*, **135.—Harrison, F. C.** The foul brood of bees, *Bacillus alvei* (Cheshire and W. Cheyne), figs., Centralblatt für Bakteriologie, Jena, July 12, '00.—**Haywood, J. K.** The adulteration and analysis of the arsenical insecticides, Journal, American Chemical Society, xxii, 9, Easton, Pa., Sept., '00.—**Howard, L. O.** See notice, *post.*—**Mally, C. W.** The fruit moth, *Ophiuza lienardi*, Agricultural Journal, Cape Town, July 5, '00.—**Marshall, G. A. K.** Fruit damaged by moths in South Africa, **8.**—[**Mingaud, G.**] The bean weevil, figs., Gardeners' Chronicle, London, July 28, '00.—**Newstead, R.** The injurious scale insects and mealy bugs of the British Isles, **54.—Sintenis, F.** The forest insects of the Baltic provinces, Sitzungsberichte, Naturforscher Gesellschaft bei der Universität Jurjeff (Dorpat) xii, 2, '99.—**Vidal, E.** Agricultural artillery against hail and grasshoppers, figs.,

Revue Scientifique, Paris, July 21, '00.—**Webster, F. M.** See Coleoptera.—**Wilson, J. H.** Disease of the black currant caused by the gall mite *Phytoptus ribis*, **54.**—Importation restrictions against danger of introduction of the San José scale [into Grmany], Gartenflora, Berlin, Sept. 1, '00.

ARACHNIDA.—Altamirano, F. Some physiological observations on the effects of the venom of the scorpion of Jojutla [in Spanish], Memorias y Revista, Sociedad Cientifica "Antonio Alzate" xiv, 7-8, Mexico, 1900.—**Cambridge, F. O. P.** Arachnida Araneidea, vol. ii, pp. 129-160,* pl. ix, **15.**—**Hamlyn-Harris, R. H.** *Chelifer cancroides:* is it a bee-parasite? British Bee Journal, London, Aug. 2, '00.

PROTOTRACHEATA.—Rucker, A. A description of the male of *Peripatus eisenii* Wheeler, **116,** August.

MYRIOPODA.—Hemenway, J. The structure of the eye of *Scutigera* (*Cermatia*) *forceps*, figs., **116,** July.

APTERYGOTA.—Skorikow, A. Essay on the geographical distribution of the Apterygota of Europe [in Russian], Travaux, Société des Naturalistes à l'Université de Kharkow, xxxiv, '00.

ORTHOPTERA.—Bruner, L. and **Morse, A. P.** Orthoptera, vol. ii, pp. 1-8, figs. [Tettiginæ*], **15.**—**Scudder, S. H.** The clear-winged species of the Oedipodine genus *Mestobregma** ; **5,** Aug. ; Localities for western Tryxalinæ, **5,** Aug. ; A list of the Orthoptera of New England, **5,** Sept.

NEUROPTERA.—Berg, K. Termitariophily, **60c.**—**Knower, H. McE.** The embryology of a termite *Eutermes* (*Rippertii?*), first paper, 4 pls., Journal of Morphology xvi, 3, Boston, Aug., '00.—**Martin, R.** New or little known Odonata,* Bulletin, Museum d'Histoire Naturale, 1900, No. 3, Paris. Rec'd. Aug. 27.

HEMIPTERA.—Berg, C. Three new Argentine Reduviidæ [in Latin], **60c.**—**Breddin, G.** Mimicry among the Hemiptera [French transl.], Bulletin, Société Linnéenne du Nord de la France, xv, 327, 328, Amiens. May, June, '00.—**Champion, G. C.** Rhynchota Heteroptera, vol. ii, pl. xix, **15.**—**Distant, W. L.** Rhynchota Homoptera, vol. i. pp. 41-43, pl. vi [Fulgoridæ*], **15.**—**Fowler, W. W.** Rhynchota Homoptera, vol. i, pp. 44-48, vol. ii, pp. 265-272, pl. xvii [Fulgoridæ,* Flatidæ*], **15.**—**Hueber, T.** Synopsis of the German "Blindwanzen" (Hemiptera heteroptera, Fam. Capsidæ), part v, Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg, lvi, Stuttgart, '00.—**Kirkaldy, G. W.** Bibliographical and nomenclatorial notes on the Rhynchota, No. 1, **9.**—**Nüsslin, O.** On the biology of the Schizoneurid genus *Mindarus* Koch, figs., **81,** July 15.—**Osborn, H.** Two new species of Jassidæ,* **4,** Sept.—**Reed, E. C.** Synopsis of the Hemiptera of Chile (cont.), **58,** July.—**Voskoboinikov, M. M.** On the classification of the Pediculina (in Russian). Dnevnik zoologicheskago Otdeleniya Obshtchestva i zoologicheskago Muzeya, ii, 7, Moscow, 1898.

COLEOPTERA.—Brèthes, F. J. *Parisanopus*, a new genus of

Staphylinidæ (Quediaria), **60c.—Casey, T. L.** Review of the American Corylophidæ, Cryptophagidæ, Tritomidæ and Dermestidæ, with other studies,* Journal, New York Entomological Society, viii, 2, June, 1900.—**Clavareau, H.** Catalogue of the Sagridæ. Annales, Société Entomologique de Belgique, xliv, 7, Brussels, Aug. 7, '00.—**Deegener, P.** Development of the mouth-parts and of the alimentary canal of *Hydrophilus*, 3 pls., **97,** lxviii, 1, Aug. 14.—**Horn, W.** Some new species of Cicindelidæ [in Latin],* **45.—Jakowleff, B. E.** Description of two new species of the family Lucanidæ, figs., **19.—Kraatz, G.** *Amblyopinus Brandesi*, n. sp., **45.—Needham, J. G.** Some general features of the metamorphosis of the flag weevil *Mononychus vulpeculus* Fabr., figs., **116,** July.—**Ohaus, F.** Contributions to knowledge of the Rutelidæ: ii. Anomalidæ of Central and South America,* **136,** 58 Jahrg.; Rutelidæ of the new world, **136,** 59 Jahrg.; Account of an entomological journey to central Brazil, **136,** 60 Jahrg.—**Sanderson, E. D.** The larvæ of *Donacia piscatrix* Lac. and *crassipes* Fab., 29 figs., **4,** Sept.—**v. Seidlitz, G.** On scent organs in beetles, **135.—Sharp, D.,** and **Perkins, R. C. L.** Fauna Hawaiiensis, vol. ii, pt. iii, Coleoptera i (pp. 91–270, pls. vi–x). Cambridge, University Press, Feb. 8, 1900. Recd. Aug. 1.—**Tschitscherine, T.** Notes on the Platysmatini of the Museum of Natural History of Paris (five papers), **19.—Webster, F. M.** *Harpalus caliginosus* as a strawberry pest, with notes on other phytophagous Carabidæ, figs., **4,** Sept.—**Weise, J.** A new *Alurnus* form, **45.**

DIPTERA.—French, G. H. A parasite the supposed cause of some cases of epilepsy [*Gastrophilus epilepsalis* larva],* fig., **4,** Sept.—**Hine, J. S.** Description of two new species of Tabanidæ,* **4,** Aug.—**Howard, L. O.** See notice, *post.*—**Johnson, C. W.** New North American Ortalidæ,* **4,** Aug.—**Mik, J.** Dipterological miscellany (3) 1, Wiener Entomologische Zeitung, xix, 6-7, July 15, '00.—**Stephens, J. W. W.,** and **Christopher, S. R.** Note on certain bodies found in the glands of two species of *Culex*, 1 pl., Further Reports to the Malaria Committee, Royal Society, London, Aug, 15, 1900.—**Wasmann, E.** *Termitoxenia*, a new wingless, physogastric Dipterous genus from Termites' nest: Part i. External morphology and biology, 1 pl., **97,** lxvii, 4, Aug. 7.

LEPIDOPTERA.—Bachmetjew, P. A remark on the propagation of butterfly aberrations, **40,** Aug. 1.—**Barrett, O. W.** Some notes on "The Cambridge Natural History," vol. vi, **4,** Aug.—**Berg, C.** On some larvæ of Argentine Lepidoptera [in Spanish], **60c.—Bird, H.** New histories in *Hydræcia*, **4,** Aug., Sept.—**Breit, J.** On the gradual darkening of some species of Lepidoptera in the vicinity of Düsseldorf, **40,** Aug. 15.—**Durand, N. N.** Notes on two Canadian butterflies, **5,** Aug.—**Dyar, H. G.** Life-histories of North American Geometridæ, xiii, xiv, **5,** Aug., Sept.; Partial life-history of *Dichogama Redtenbacheri* Led. **4,** Sept.; Note on the genus *Dyaria* Neum., **4,** Sept.—**Fernald, C. H.** North American species of *Choreutis* and its allies,* **4,** Aug.—

Fletcher, J. Description of the full-grown larva of *Grapta j-album*, **4,** Sept.—**Frings, C.** Destruction of butterflies by birds, **40**, Aug. 15.—**Godman, F. D.** Lepidoptera Rhopalocera, vol. ii, pp. 461-484, pl. xcii [Pamphilinæ*], 15.—**Grant, C. E.** [*Erebus odora* in Ontario], **4,** Sept.—**Grote, A. R.** Systema Lepidopterorum Hildesiæ (second series); Phylogeny and delimitation of the families of butterflies with genealogical tree, pl., Mitheilungen aus dem Rœmer Museum, Hildesheim, No. 11, April 19, '00; Relationships among the butterflies, Insekten Börse. Leipsic, Aug. 2, '00; Historical sketch of *Gortyna* and allied genera, Proceedings, American Philosophical Society, xxxix, No. 162, Philadelphia, April to June, 1900.—**Hampson, G. F.** On some tetratological specimens of Lepidoptera, **8.**—**Hofman, O.** On the natural history of the Eriocephalidæ and Micropterygidæ, **135.**—**Moore, F.** Lepidoptera Indica. Parts xliv, xlv, London: Lovell Reeve & Co., 1900. Rec'd. Sept. 3. (Vol. iv, pp. 161-176, pls. 341-348; pp. 177-192, pls. 349-356. Nymphalinæ, groups Nymphalina and Argynnina).—**Skinner, H.** Revision of the American species of the genus *Cœnonympha*, 1 pl., Transactions, American Entomological Society, xxvi, Philadelphia, July, '00.—**Smith, J. B.** New Noctuids from British North America, with notes on some others,* 1 pl., **4,** Aug.; A hundred new moths of the family Noctuidæ,* Proceedings, United States National Museum, No. 1203, Washington, 1900. Rec'd. Aug.—**Snellen, P. C. T.** Some remarks on the subdivision of the genus *Agrotis* Led., **136,** 58 Jahrg.—**Tutt, J. W.** The connection between primary and secondary sexual characters in Lepidoptera; Is the separation of the Papilionides from other butterflies warranted? Entomologists' Record, London, Aug. 1, '00.—**Warren, W.** New genera and species of American Drepanulidæ, Thyrididæ, Epiplemidæ and Geometridæ,* Novitates Zoologicæ, vii, 2, Tring, Aug., '00.

HYMENOPTERA.—Ashmead, W. H. Report upon the Aculeate Hymenoptera of the Islands of St. Vincent and Grenada, with additions to the Parasitic Hymenoptera, and a list of the described Hymenoptera of the West Indies,* Transactions, Entomological Society, London, 1900, pt. ii, July 14.—**Cockerell, T. D. A.** Some bees visiting the flowers of mesquite,* **9.**—**Emery, C.** On ant larvæ, **135.**—**Forel, A.** On North American ants, **135.**—**Friese, H.** Die Bienen Europa's (Apidæ Europaeæ) nach ihren Gattungen, Arten und Varietäten auf vergleichend morphologischer-biologischer Grundlage bearbeitet. Mit Unterstützung der kaisl. Akademie der Wissenschaften in Wien. Druck u. Verlag von C. Lampe, Innsbruck u. Imst. Theil IV. Solitäre Apiden: Genera *Eriades*, *Trachusa*, *Anthidium*, 1898. 303 pp., 55 text-figs., 1 pl. Theil V. Solitären Apiden: Genera *Lithurgus*, *Megachile* (*Chalicodoma*), 1899. 228 pp., 9 text-figs.—**Hamlyn-Harris, R. H.** See Arachnida.—**Klein, E. J.** The rose-leaf bee (*Megachile centuncularis*), figs., Fauna, ix, Luxembourg, '99.—**Mackenzie, V. St. C.** The ant-hills at the Paris Exhibition, **9.**—**F. M.** G. Lagerheim's "On *Lasius fulginosus* Latr. and its fungus cultivation," Naturwissenschaftliche Rundschau,

Braunschweig, July 28, '00.—**Newberry, M.**, and **Cockerell, T. D. A.** Notes on the nesting of *Anthidium paroselæ* Ckll., **5**, Aug.—**Reed, E C.** Four species of Hymenoptera new to the fauna of Chili [in Spanish], **58**, June.—**Wheeler, W. M.** The female of *Eciton Sumichrasti* Norton, with some notes on the habits of Texan Ecitons, figs., **3**, July.—**Yung, E.** How many ants are there in one nest? Archives des Sciences Physiques et Naturelles, x, 7, Geneva, '00.

Howard, L. O. Notes on the mosquitoes of the United States: giving some account of their structure and biology, with remarks on Remedies. Bulletin No. 25, new series, U. S. Dep't of Agriculture, Division of Entomology, Washington, 1900. 70 pp., 22 figs. "The demand for the publications of this Division on mosquito subjects has been so great that it has been deemed desirable to bring together the published and unpublished articles and notes in convenient reference form from the the standpoint of the United States only, and this has been done in the present Bulletin." The contents are made up of such topics as the abundance of mosquitoes, length of life and the food of the adult, their power of flight, their distribution by railroad trains, ability of the larvæ to live out of water, synoptic tables of the North American species (genera *Culex*, *Anopheles*, *Psorophora*, *Megarhinus*, *Aedes.*), the biology of *Culex*, and of *Anopheles*, natural enemies of mosquitoes and remedies against them.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

LARVÆ of *Papilio asterias* are feeding on *Cosmos* in my flower garden. Is this not a new food plant? It is a long way from celery or parsnips in the matter of relationship of food plants as well as in garden.—F. M. WEBSTER, Wooster, Ohio.

A FORTUNE IN MOTHS.—The death has occurred at Eastbourne of one of the foremost entomologists of the day, in the person of William Watkins, whose success had earned for him the name of "The Butterfly King." Of Welch extraction, he began collecting butterflies when he was a schoolboy at nine. At that time, says *The London Express*, there were fields in the vicinity of Peckham, and the first butterfly Mr. Watkins ever caught was "The Peacock." From thenceforth he became an ardent entomologist; he gradually went on collecting moths, and eventually he made this the business of his life.

He was articled to some ship and insurance brokers, and spent his leisure time collecting, often staying out until midnight in pursuit of treasures he coveted. In his desire to "see life" he went to India, where he had plenty of scope for his love of entomology. After a sojourn of six years in India, he returned to England, and was able to sell a large collection to Mr. Horniman, the well-known tea merchant.

He then commenced business as a professional entomologist, and opened establishments in Piccadilly and in the Strand. In 1881 he formed the Insect House in the Zoological Gardens.

During the past ten or eleven years he resided at Eastbourne, where he carried on the breeding of butterflies of the most diverse specimens; they were in all stages of development—the larva, or caterpillar, the chrysalis and the butterfly.

THE LARVA OF THECLA MELINUS HUBN.—On April 17, 1900, Prof. E. O. Wooton brought me a lycænid larva found living on the flowers of a *Echinocactus intertextus* Engelm., in the Mesilla Valley, N. M. The larva burrows into and eats the flowers, which are white, not purplish as described in the books. The imago was bred May 8th, and proves to be *Thecla melinus* Hubn. I have formerly observed this butterfly to be prayed upon by the bug *Phymata fasciata*.

Larva.—Slug like; 14 mm. long, 6 broad; entirely apple green, a very faint darker dorsal stripe enclosing an interrupted light stripe. Whole surface thickly covered with short brownish bristles. Under side, including legs, light green. Head small, shining dull white; eyes on black patches; mandibles reddish brown. When the larva is at rest the head is not visible from above. The other larva was whitish, with faint pinkish markings; two dorsal lines; oblique stripes, two on each side of each segment; and the lateral keel, which is whitish, edged with pale pinkish. The excrement, owing to the nature of the food, is light lemon yellow.—T. D. A. COCKERELL, N. M. Agr. Exp. Station.

Doings of Societies.

At the June meeting of the Feldman Collecting Social, held at the residence of Mr. H. W. Wenzel, 1523 S. 13th street, twelve members were present.

Mr. C. W. Johnson exhibited a larva found in a spring at Riverton, N. J., which he had tried unsuccessfully to keep alive. It seems to be the early stage of a large Tipulid, agreeing well with the description by Hart of Tipulid larvæ from the Illinois River. From its great size it may be *Tipula abdominalis*.

Mr. P. Laurent remarked on the lack of knowledge regarding the early stages of many of the Hesperidæ, notwithstanding that these larvæ are perhaps the easiest cared for of any Lepidoptera. He believed almost all species of this family would live on any of the grasses.

Mr. H. W. Wenzel described collecting in an old barn situated in the Philadelphia "Neck." About 30 species of Coleoptera

had been taken, most of which were entirely new to the speaker's collection, and many had never been recorded from this region. The same speaker showed *Cedius Ziegleri*, taken from the nest of *Formica exsectoides*.

Dr. Skinner referred to Mr. Laurent's remarks on rearing Hesperidæ, and said that while a number of species may feed on grass, yet many live on grasses which are pecular to certain regions and are not obtainable for rearing. He cited *Pamphila panoquin* as one that will not thrive on grasses of the vicinity of Philadelphia. Other species do not feed on grass.

The subject was further discussed by Messrs. Laurent, Skinner and Wenzel. Mr. Laurent maintained that he had raised numerous sea-shore species of *Pamphila* on the common grasses from near Philadelphia.

The feeding of *Cecropia* larvæ on rose bushes was discussed by several members.

Mr. Harbeck reported the capture of *Batrisus frontalis* and *riparius* in Fairmount Park, Philadelphia, the former being new to this region.

WILLIAM J. FOX, *Secretary*.

The seventh regular meeting of the Harris Club was held at 35 Court Street, Boston, on the evening of May 18, 1900. Messrs. W. D. Denton, R. W. Denton and J. H. Rogers, Jr., were elected members. Mr. W. D. Denton described a trap-lantern used by Mr. Morse, consisting essentially of an arrangement of board partitions to form four funnels, with the smaller ends in the centre of the group and the larger ends opening in four directions. The lamp is placed at the common centre of the funnels, in a glass box, each side of which forms the inner end of one of the funnels. The inner surfaces are painted white, and a trough filled with kerosene receives the moths which fly against the glass. On removal the specimens are cleaned by immersion in benzine. Mr. Newcomb showed a killing device which is conveniently made of any tin box, and contains a long strip of soft paper folded in accordeon plaits, with the ends of the plaits uppermost. The insects can be dropped between the folds of paper, thus preventing motion of the wings. Mr. Low advocated the use of chloroform for kill-

ing, on account of its rapid action. He employs a common jelly tumbler with a tin cover; a ring on the inside of the cover holds a sponge designed to receive the chloroform. Mr. Rogers reported an examination of the pupa contained in one of the inflated cocoons of *Attacus cecropia*, which were discussed at the April meeting; the pupa in this case was alive, and not parasitized. Mr. Newcomb showed a specimen and nest of *Cteniza californica*.

The eighth regular meeting was held June 15, 1900. Messrs. C. E. Preston, Frank Sherriff and John S. Rogers were elected to membership. It was voted to hold a field meeting in July. Mr. Newcomb told of great success in collecting about electric lights. A screen of white netting, attached to strings thrown across the wires overhead, secured many specimens which would otherwise have alighted on buildings out of reach. Messrs. Bolster and Smalley reported the capture, in Mattapan and Dorchester respectively, of two fine femals of the rare *Sphinx luscitiosa*. Mr. Field mentioned a specimen of the same moth, now in his collection, which was secured in Milton, Mass., by Mr. T. T. Whitney, Jr., in 1896. Mr. W. D. Denton announced the reappearance of *Papilio philenor* in Wellesley.

W. L. W. FIELD, *Secretary*.

OBITUARY.

George Ruscheweyh, lepidopterist, died at Buenos Aires, Argentina, August 2, 1899. He was born July 20, 1826, in Mecklenburg Schwerin, Germany. From early youth he possessed a great love for natural history; his first collection of butterflies was made as a boy. He went to South America in 1846, landing in Chili, in which country he lived for some time, doing business as an importing merchant and devoting his leisure to his studies in natural history. In 1854 he went to the Argentine Republic, where he was for many years a leading merchant. In his declining years he retired partly from active pursuits. His collection of Lepidoptera was the result of the work of twenty-five years of collecting and exchanging, and is cited in the works of Burmeister and of Berg. It is deposited in the Argentine National Museum, and will probably be purchased by the government. Mr. Ruscheweyh had many correspondents in the United States, who will greatly miss his assistance.—HARRISON G. DYAR.